

# Coastkeeper/NRDC's Presentation on Feasibility of Numeric Effluent Limits for Stormwater Permits

—  
September 14, 2005

1

## INTRODUCTION

Daniel Cooper

2

## Determining Compliance with the General Permit as drafted is Resource Intensive and often Judgment Based

- “A determination of a violation of the Receiving Water Limitations will be site specific and may be based on various factors, including indicator monitoring results, visual observations of the site, discharges, and the receiving water, and a review of BMPs.” —*Fact Sheet p. 15*

3

## Benchmark Levels Do Not Determine Compliance

- “...these benchmarks are not numeric storm water effluent limits, are not related or necessarily protective of any specific receiving water, and exceedances of these benchmarks are not automatically considered permit violations.”  
—*Fact Sheet p.14*

4

## The “Many Factored” Judgment Based Compliance Standard Leaves Permittees in Uncertainty and Complicates Enforcement

- Dischargers Will Never Know How the RWQCB Will Apply the “Various Factors” and Thus Cannot Be Certain of Compliance
- The Lack of an Objective Standard for Determining Compliance Makes Evaluating Enforcement (and thus defending it in the Courts) Complicated and Resource Intensive

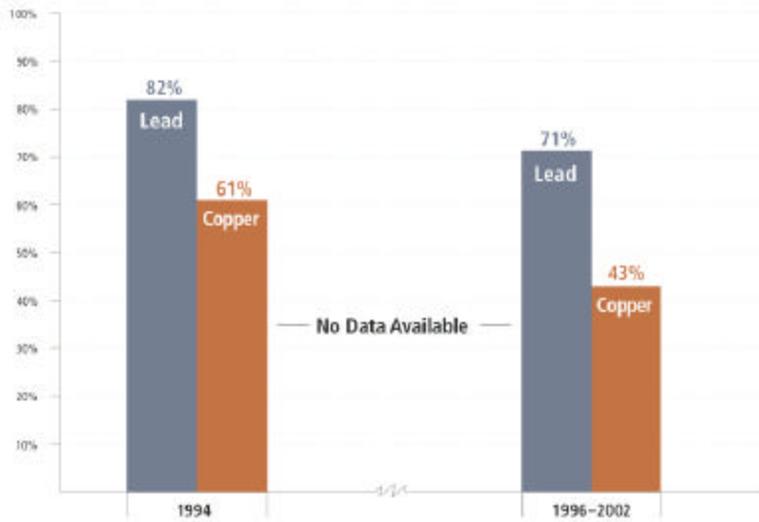
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## The Permit is Complicated and Requires Significant Documentation and Reporting by Permittees

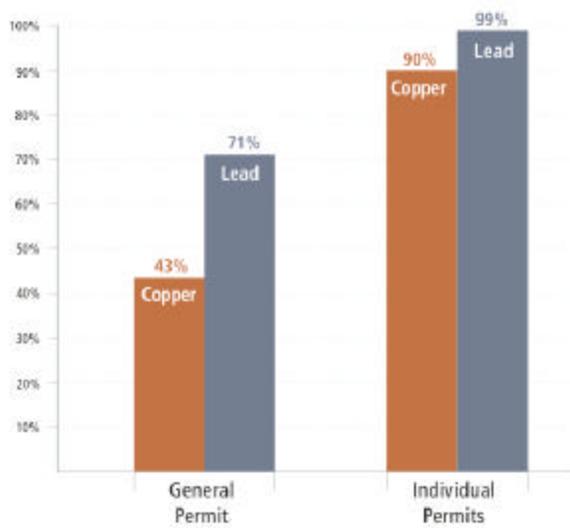
- The Permittees must develop and implement BMPs that both meet the BAT/BCT standard and prevent violations of Water Quality standards
- The Permit Provides Little Guidance on BAT/BCT, and No Guidance on Meeting Water Quality Standards
- The Permittee Must Generate a SWPPP, a Monitoring Program, Inspection Reports, and an Annual Report. Failure to Properly Prepare These Reports is a Violation of the Permit and the CWA

6

### Permit Compliance with Storm Water Benchmarks



### Compliance with Storm Water Benchmarks: General vs. Individual Permits



## Percent of Samples Exceeding CTR (Continuous Criteria) Region 4, 2001-2002



The percentages represented are estimates because the continuous criterion values are close to laboratory detection limits for these elements.





11



12

## Construction Permit Implementation Survey

- February 2004—December 2004
- 30 Construction Sites in Northern California
- Conducted by Ecological Rights Foundation for the Rose Foundation

13

## Conclusions

- 24 of 30 (80%) sites had grossly deficient BMPs to control stormwater pollution
- 11 samples collected at 7 non-complying sites for TSS ranged between 240 mg/L and 7000 mg/L

14

## Developing Numeric Effluent Limits is not Infeasible, and Will Result in Significant Savings of Resources in Oversight and Enforcement of the Permit

- An Initial Investment of State Board PYs in Developing the Limits Will Save Tremendous Resources at the RWQCB Level Over the Life of the Permit.
- Enforcement Will Be Efficient, Certain and Fair If Based on Objective, Numeric Effluent Limits

15

## FEASIBLE DISCHARGE LIMITS FOR CONSTRUCTION PERMITTEES BASED ON BEST AVAILABLE TECHNOLOGY (BATs)

Dr. Richard Horner

16

## Components

- Identification of potential pollutants
- General monitoring considerations
- Proposed discharge limits
- Background and rationale
- Remediation considerations

17

## Identification of Potential Pollutants

- Category 1: Sediments from areas subject to clearing and grading
  - Categories 2-4: Materials used, stored, or with spill potential during construction
  - Categories 5-9: Materials used, stored, spilled, applied, or released during past land use\*
  - Category 10: Materials with polluting potential incidentally present in soils\*
- \* Analysis of past land use activities and soil sampling and analysis required

18

## General Monitoring Considerations

- Discharge sampling within the first hour of runoff and then every 3 hours
- Discharge limit a water quality standard or benchmark, unless options available:
  - Pre-construction baseline monitoring study
  - Reference flow sampling (if true reference, with no or minimal upstream human influence)
  - Mixing zone identification (if not 303(d) listed)

19

## Optional Discharge Limits

- Baseline monitoring: Lowest concentration in baseline study (above standard or benchmark)
- Reference sampling: Reference sample concentration
- Mixing zone: Sample concentration estimated at mixing zone boundary by mass balance calculation

20

## Monitoring to Establish Mixing Zone

- Discharge flow rate or volume and pollutant concentration(s)
- Flow rate or volume and pollutant concentration(s) of any flow joining discharge
- Receiving water flow rate or volume and pollutant concentration(s) outside mixing zone
- Receiving water flow rate or volume and pollutant concentration(s) inside mixing zone

21

## Feasible Category 1 Discharge Limits

- If 303(d) listed with water quality standard, sample as in Guidance Document (GD), use standard as limit
- If no standard or can't sample as in GD, sample discharge, analyze turbidity (field) and TSS (lab)—
  - Turbidity instant indication of possible violation (begin remediation), confirmation if standard exists
  - TSS confirms if violation (full remediation)

22

## Category 1 Limits (cont'd)

Feasible limits if no standards:

- Turbidity—25 NTU mean, 75 NTU max.
- TSS—50 mg/L mean, 260 mg/L max.

(or concentration established through optional baseline, reference, or mixing zone study)

23

## Rational for Category 1 Limits

- Tests of effectiveness of mat and mulch products relative to soil loss from bare slopes
- Bare soil TSS ranged 80-39510 mg/L (mean 7255 mg/L), turbidity 63 to >1000 NTU
- Wood fiber mulch, bonding agent, seeding—TSS mean 50, max. 256 mg/L; turbidity mean 21, max. 73 NTU

24

## Feasible Discharge Limits for Categories 2-4

- If 303(d) listed as impaired for the identified pollutant(s), use water quality standard as limit
- If not 303(d) listed, use benchmark as limit (or concentration established through optional baseline, reference, or mixing zone study)

25

## Feasible Discharge Limits for Categories 5-10

- Use field turbidity with limits given earlier as instant indication of possible violation (begin remediation)
- If 303(d) listed as impaired for the identified pollutant(s), use water quality standard as limit
- If not 303(d) listed, use benchmark as limit (or concentration established through optional baseline, reference, or mixing zone study)

26

## Remediation Considerations

- Full remediation within 2 weeks, unless laboratory results confirm no violation
- If 0.25” rain with 40% probability within 2-week period, complete full remediation or apply short-term measure
- If violation, independent inspection until end of construction

27

## FEASIBLE NUMERIC EFFLUENT LIMITS FOR INDUSTRIAL/MUNICIPAL STORMWATER

Richard Rollins

28

# BMP Database website

**International Stormwater Best Management Practices (BMP) Database**

**Home**  
**BMP Menu**  
**Project Background**  
**Contact Us/Support**

**Project Description**

**WERF**  
**ASCE**

The project, which began in 1996 under a cooperative agreement between the American Society of Civil Engineers (ASCE) and the U.S. Environmental Protection Agency (EPA), was developed and funded from a broad coalition of partners including the State Environmental Research Foundation (SERF), U.S. Environmental Water Resources Institute (EWRI), US EPA, Federal Highway Administration (FHWA), and the American Public Works Association (APWA). Other partners include the National Stormwater Association, National Sanitation Foundation, and the National Sanitation Foundation for the Environment.

**EWRI**  
**EPA**  
**ADWA**

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**On this website, you can find:**

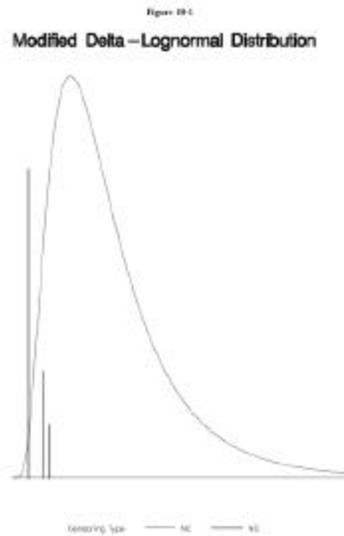
- documentation protocols for submitting BMP monitoring studies for inclusion into the database
- guidance for submitting standardized BMPs to meet these protocols
- the ability to search for individual BMPs monitoring study data
- performance criteria for individual BMPs, though for on-line searchable database containing roughly 200 BMPs
- statistical summaries of the overall BMP database
- a periodic summary of performance for BMP types (e.g., wet ponds)
- technical reports describing the methods of technical evaluation for predicting BMP performance and the results of performance evaluations
- published papers from conference proceedings and journals on the BMP database and
- other useful information.

http://www.bmpdatabase.com/

29

# EPA's Distribution

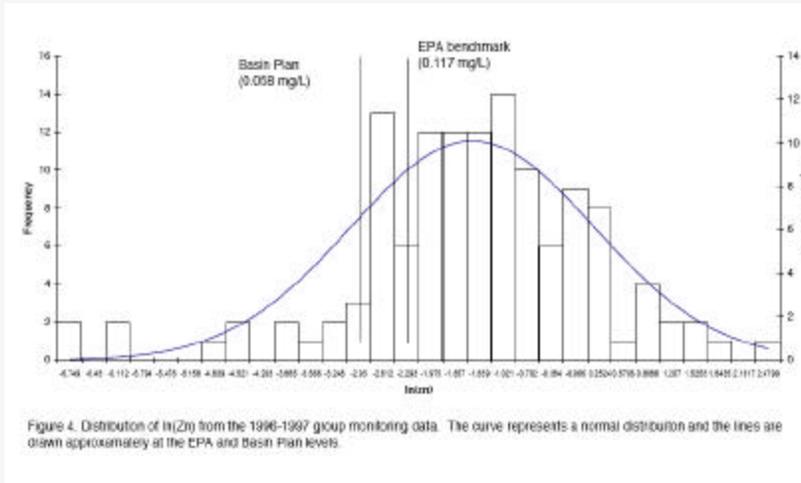
Chapter 10: Data Distributions of C and Delta (C and Delta) | Environmental Data Science for the U.S. EPA | Book Series | Contents



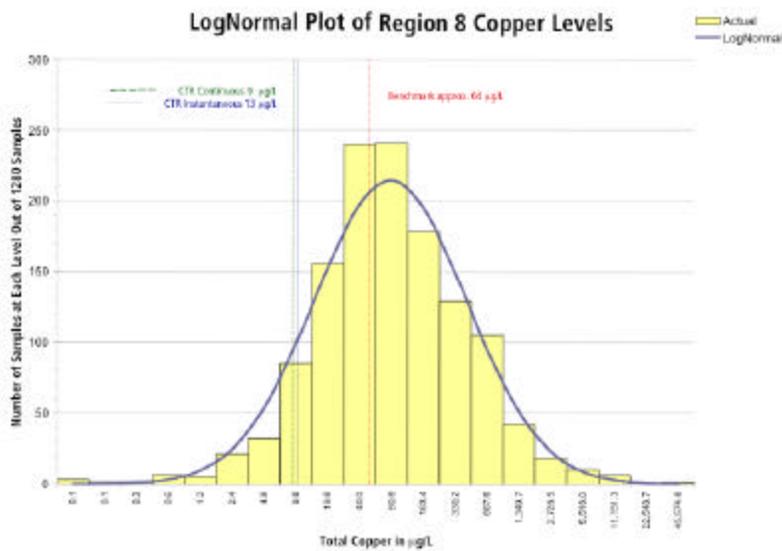
10-23

31

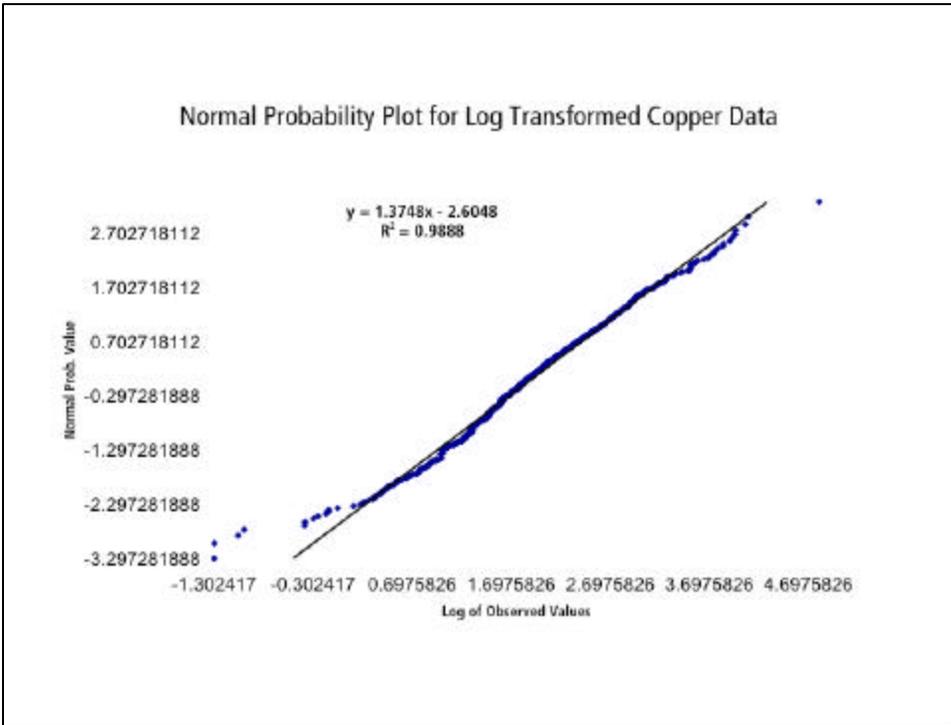
# Log Transformed Data



31



33



## EPA's Approach

Technical Development Document  
for the Final Effluent Limitations  
Guidelines and Standards for  
the Meat and Poultry Products  
Point Source Category

U.S. EPA Office of Water  
Engineering and Analysis Division  
July 2004

## 14.6.2 Selection of Percentiles

EPA calculates limitations based upon percentiles chosen, on one hand, to be high enough to accommodate reasonably anticipated variability within control of the facility and, on the other hand, to be low enough to reflect a level of performance consistent with the Clean Water Act requirement that these effluent limitations be based on the “best” technologies. The daily maximum limitation is an estimate of the 99th percentile of the distribution of the *daily* measurements. The monthly average limitation is an estimate of the 95th percentile of the distribution of the *monthly averages* of the daily measurements.

Meat and Poultry Products Technical Support Document 14.6.2

35

## Legal Validation

*Chemical Manufacturers Association v. U.S. Environmental Protection Agency*, 870 F.2d 177, 230 (5th Cir. 1989). The Court determined that:

EPA reasonably concluded that the data points exceeding the 99th and 95th percentiles represent either quality-control problems or upsets because there can be no other explanation for these isolated and extremely high discharges. If these data points result from quality-control problems, the exceedances they represent are within the control of the plant. If, however, the data points represent exceedances beyond the control of the industry, the upset defense is available. *Id.* at 230.

Meat and Poultry Products Tech Support Doc. Section 14.6.2

36

## Legal Validation

This approach for the monthly average limitation was upheld in *National Wildlife Federation, et al v. Environmental Protection Agency*, 286 F.3d 554 (D.C. Cir. 2002). The Court determined that:

EPA rejected Industry Petitioners' claim that facilities are expected to operate processes and treatment systems so as to violate the limitations at some pre-set rate... These limitations were never intended to have the rigid probabilistic interpretation that Industry Petitioners have adopted. Therefore, we reject Industry Petitioners' challenge to the effluent limitations.

Meat and Poultry Products Tech Support Doc. Section **14.6.2**

37

## Maximum Flow Restriction

Above 50-year 24-hour rain event, numeric limit would be relaxed.

As that Court recognized, EPA's allowance for reasonably anticipated variability in its effluent limitations, coupled with the availability of the upset defense, reasonably accommodates acceptable excursions.

Meat and Poultry Products Tech Support Doc. Section **14.6.2**

38

## Historical Precedents

**This percentile approach has been used by EPA over the last 2 decades in other Effluent Guidelines including:**

- Organic Chemicals, Plastics, and Synthetic Fibers (OCPSF, 40 CFR Part 414)
- Pulp and Paper Category (40 CFR Part 430)
- Landfills Point Source (40 CFR Part 445)
- Centralized Waste Treatment 40 CFR 437

39

## Proposed BAT Method

- The IBMPDB provides analytical results from over 1600 systems treating urban runoff that have been collected under a specified protocol and validated by the IBMPDB sponsors.
- Systems evaluated include hydrodynamic devices, biofilters, detention basins, media filters, wetland basins, grassy swales, as well as others not listed here.
- The average was used to provide a preliminary BAT level instead of some lower percentile level because the lower percentiles were felt to be too difficult to meet for an initial regulatory effort.

40

## GISWP Proposed BAT Limits

Item	Parameter	Proposed BAT	Benchmark	CTR (see note 10)	Rationale	Alt. Prop. BAT	Alt. Rationale
1.	T. Phosphorus	0.2 mg/L	2 mg/L	na	See notes 1,2, and 11	0.1 mg/L	Lahontan NPDES permit CAG616003
2.	T. Suspended Solids	50 mg/L	100 mg/L	na (Lahontan Basin Plan has limits for turbidity, 20 NTU)	Coal Pile Runoff associated with Steam Electric Power Generating Point Source, 40 CFR 423	25 mg/L 30 day average, 45 mg/L 7 day average; 25 mg/L (IBMPDB, See note 6)	Best Practicable Technology, Colorado Sand and Gravel Discharge Permit Number Cog-500000 See note 3

*(continued)*

41

## GISWP Proposed BAT Limits

Item	Parameter	Proposed BAT	Benchmark	CTR (see note 10)	Rationale	Alt. Prop. BAT	Alt. Rationale
3.	Total Nitrogen	2 mg/L	na	na	See notes 1,2, and 12		
4.	Total Copper	15 _g/L	63.6 _g/L	3.1 _g/L salt water continuous	See note 5	10 _g/L	See note 2
5.	Total Lead	15 _g/L	81.6 _g/L	2.5 _g/L fresh water continuous	see note 9		
6.	Total Zinc	110 _g/L	117 _g/L	81 _g/L salt water continuous	see Note 4	55 _g/L, 60 _g/L	See note 2, See note 7
7.	Oil and Grease	10 mg/L	15 mg/L	na	State Effluent Regulations, Colorado Sand and Gravel Discharge Permit Number Cog-500000 See note 3		
8.	BOD5	37 mg/L	30 mg/L	na	see Note 4		
9.	COD	40 mg/L	120 mg/L	na	see Note 8		

42

# Municipal Permit with Numeric Limits

MUNICIPAL NPDES STORM WATER PERMIT -11- BOARD ORDER NO. 6-40-82  
 CITY OF SOUTH LAKE TAHOE WDEB NO. 6A099110063  
 El Dorado, and Placer Counties NPDES NO. CAG616001

## I. DISCHARGE SPECIFICATIONS

### A. Effluent Limitations

- All storm water/urban runoff flows generated within the Project Area which are discharged to publicly owned or maintained land treatment or infiltration systems, or to surface waters shall not contain constituents in excess of the following limits:

Maximum Concentration for Discharge to:

Constituent	Units*	Land Treatment/ Infiltration Systems	Surface Waters
Total Nitrogen	mg/L as N	5.0	0.5
Total Phosphorus	mg/L as P	1.0	0.1
Total Iron	mg/L	4.0	0.5
Turbidity	NTU	200	20.0
Grease and Oil	mg/L	40	2.0

\*mg/L milligrams of substance per liter of storm water

\*NTU nephelometric turbidity units

# Enforcement of Numeric Limits

SQUAW VALLEY SKI AREA  
 Placer County

3

CLEANUP AND ABATEMENT  
 ORDER NO. R6-2001-0074

Table 1. Mean of Monthly Mean for the Period of 4-12-92 to 6-06-01<sup>1</sup> for Areas Affected by the Dischargers' Parking Lot Runoff

Sampling Locations	Constituents								
	Turbidity NTU	TDS mg/l	TSS mg/l	NO3 mg/l	TKN Mg/l	Total N mg/l	P mg/l	CL mg/l	Fe mg/l
	Receiving Water Limitations								
	3	85	NS	0.05	0.13	0.18	0.02	3	0.13
SC-16	4.88	32.46	9.53	0.16	0.13	0.24	0.07	1.68	0.27
SC-18	13.15	81.68	21.51	0.24	0.11	0.31	0.07	2.41	0.73

\* Shaded values denote violations for the above-referenced sample locations

\*\* NS - Numerical water quality objectives not specified in the Basin Plan.

## Example: TSS or Turbidity

Parameter	TSS (mg/L)	Turbidity (NTU)
Caltrans Retrofit Study	10	–
BMP Database (Mean)	25	–
Construction (Mean)	50	25
Benchmark	100	

45

## SUMMARY AND CONCLUSION

David Beckman

46

## Numeric Effluent Limits

Best management practices (BMPs) to control or abate the discharge of pollutants when:

(3) numeric effluent limitations are infeasible

40 CFR §122.44 (k)(3)

47

## The Successful Development of Numeric Effluent Limitations for Stormwater Clearly Demonstrates that Such Limitations are Feasible.

Some examples in California include:

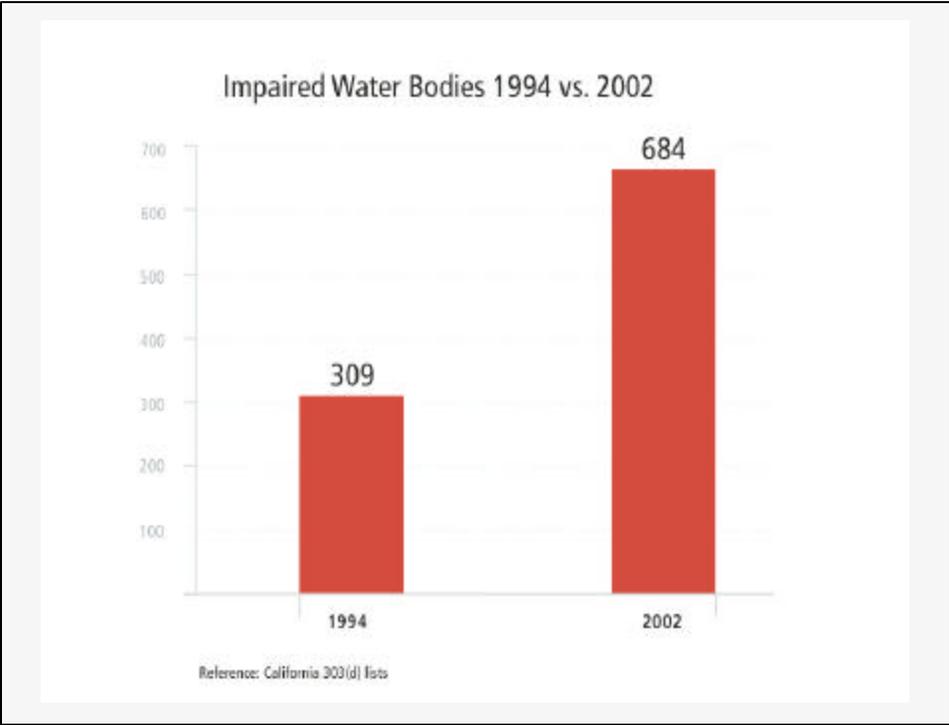
*40 CFR Subchapter N following subcategories:*

- **Phosphate Subcategory, Fertilizer Manufacturing Point Source** (limits for total phosphorus and fluoride) 40 CFR § 418.10;
- **Cement Manufacturing Facility, Materials Storage Piles Runoff** (limits for TSS and pH) 40 CFR § 411.30;
- **Asphalt Emulsion Subcategory, Paving and Roofing Materials Point Source** (limits for TSS, oil & grease, and pH) 40 CFR § 443;
- **Crushed Stone, Construction Sand and Gravel, Industrial Sand** (limits for TSS and pH) 40 CFR § 436;
- **Coal Pile Runoff associated with Steam Electric Power Generation** (limits for TSS and pH) 40 CFR § 423; and
- **Coal Mining** (limits for SS, Fe, and pH) 40 CFR § 434.

*MS4 permit for the Tahoe Basin:*

**Total nitrogen, total phosphorus, total iron, turbidity, oil and grease.**

48



End.